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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: DULLIEN

Serial No.: 09/872,010

Filed: June 4, 2001

For: Process And Device For Eliminating The Particles Contained In A Stream Of Fluid

Group: 1724

Examiner: Bushey, C.

REQUEST FOR RECONSIDERATION AFTER FINAL REJECTION

Assistant Commissioner
For Patents
Washington, D.C. 20231

May 17, 2002

Sir:

This is in response to the Office Action mailed January 17, 2002, in connection with the above-identified application.

Claims 1, 2, 4, 7, 9, 10, 13, 14, 16 0 18, 20 and 21 stand rejected under 35 USC 102(b) as allegedly being clearly anticipated by published British Patent Specification No. 632,360 (Britain 632,360). Applicants again traverse this rejection and request reconsideration thereof.

The present invention relates to a device and method for eliminating particles contained in a stream of fluid. The device and method of the present invention can be classified as turbulent flow dust or particle removers since they rely on turbulent flow of the fluid stream and turbulent eddies carrying the particles to penetrate into stagnant zones to deposit the particles on the surfaces of objects forming the stagnant zones adjacent the flow passage. See, e.g., the paragraph bridging pages 1 and 2 of applicants' specification.

The embodiments claimed use fibrous pads, fabrics or mats as the objects defining the stagnant spaces for collecting the particles. The elected species includes a flow channel in a tubular shape, wherein the flow channel is defined by the pad, mat or fibrous fabric. See, Figures 6a and 6b and the description at page 9, line 28 et. seq. of applicants' specification.

Britain 632,360 discloses separation of solid particles from air or other gases and utilizes a wool-coated surface as a means for retaining separated dust, but specifically discloses that the separator "reduces the turbulence of the air to a minimum." See page 1, lines 31 - 36 of Britain 632,360. See, also, page 3, lines 24 - 33 of this document which indicates that the gas stream entering the channel is substantially void of turbulence. On the other hand, the device and method of the present invention involve the turbulent flow of the fluid stream. Britain 632,360 teaches away from this aspect of the present invention.

In the Examiner's response in numbered section 9 of the office action to applicant's arguments, the Examiner alleges as follows.

> The British reference teaches throughout that turbulent flow of the fluid stream through the device is the reason the device is capable of separating solid particles from the fluid stream. In fact the two portions of the reference cited by applicant simply emphasize that the turbulence need only be minimal. Please note lines 37-40 on page 1 of the reference, wherein it is stated "that even a small component of velocity at right angles to the general flow will suffice to being a dust particle into contact with the wool." A fluid flow having a component of velocity at right angles to the general flow is in turbulence. Fluid flow is either laminar, i.e., entirely aligned with the general flow direction of the fluid, or turbulent, i.e., flow that while it may include portions that are aligned with the general flow, it also must include portions or a component of velocity at right angles to the general flow, it also must include portions or a component of velocity at right angles to the general flow, as result from the formation of eddies within a fluid stream.

Applicant submits, however, that although Britian 632,360 discusses eddies and vortex flow as possible theories for collecting and retaining dust, the flow in the separator of Britain 632,360 is not "turbulent flow." Turbulent flow is a fluid motion in which velocity, pressure and

other flow quantities fluctuate irregularly in time and space. In turbulent flow, eddy patterns are complex and flow quantities (including vorcitity) fluctuate randomly in time and three-dimensional space. McGraw Hill Encyclopedia of Science and Technology, 7th Edition, Volume 18, pages 632 - 636, a copy of which is attached. The fact that the inventor of Britain 632,630 theorizes that there may a small component of velocity of right angles to the general flow or eddies or vortex flow, does not necessarily mean that the flow is turbulent flow. That is, the flow is not turbulent flow unless the eddy patterns are complex and the flow quantities including vorticity, fluctuate randomly in time and space.

The effects of turbulent flow in a precipitator or separator are described in the attached article by Professor Dullien entitled "Theory and Practice of A New Class of Equipment for Separation of Particulates from Gases; the Turbulent Flow Precipitator."

For the foregoing reasons, it is submitted the presently claimed invention is not anticipated by Britain 632,360.

Claims 3 and 22 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Britain 632,360 taken together with United States Patent No. 3,487,610 to Brown et al. Applicants traverse this rejection and request reconsideration thereof.

The Examiner relies on the patent to Brown et al as allegedly disclosing an apparatus for removing particles from a fluid stream similar to that of the British reference but wherein the elements are electrostatically charged. However, the patent to Brown et al discloses a device quite different than that of Britain 632,360. In Brown et al, the filter comprises a laminated structure of polymeric films having an exceptionally high and stable positive electrostatic charge on one side thereof and a corresponding negative charge at the other. The filter unit of Brown et al apparently relies solely on electrostatic charges to separate the particles from the fluid stream.

In view of the differences between Brown et al and the British reference, it is submitted there would have been no motivation to combine the teachings of these documents in the manner urged by the Examiner. Moreover, even assuming, arguendo, one of ordinary skill in the art would have combined the teachings of these documents, it is submitted the Brown et al patent does not remedy any of the basic deficiencies of Britain 632,360. Therefore, claim 3 is patentable over the proposed combination of references.

Claims 8 and 23 stand rejected under 35 USC 103(a) as being unpatentable over Britain 632,360 taken together with any one of United States Patent No. 3,545,178 to Sheehan, United States Patent No. 3,808,776 to Jesernig et al, United States Patent No. 3,955,947 to Hoon et al and United States Patent No. 4,289,630 to Schmidt, Jr. et al. Applicants traverse this rejection and request reconsideration thereof.

The Sheehan, Jesernig et al, McClure, Hoon et al and Schmidt, Jr. et al patents have been relied upon by the Examiner solely for their alleged teachings of shaker means for periodically shaking filter elements. However, even assuming, arguendo, the secondary references discloses this feature and are combineable with Britain 632,360, even the combined teachings would not have suggested the presently claimed invention. That is, the secondary references do not remedy any of the basic deficiencies of Britain 632,360. Accordingly, claim 8 is patentable over the proposed combination of references.

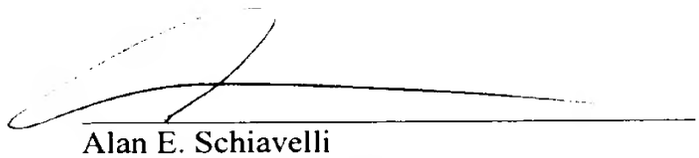
In view of the foregoing remarks, favorable reconsideration and allowance of all of the claims now in the application are requested.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit

Account No. 01-2135 (Case: 612.34893VV3), and please credit any excess fees to such deposit account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP



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